UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA, Plaintiff, v. PHILIP MORRIS USA INC., f/k/a PHILIP MORRIS INC., et al., Defendants.	Civil Action No. 99-CV-02496 (GK) Next scheduled court appearance: Trial (ongoing)

TESTIMONY OF GREGORY A. WULCHIN UNDER ORDER #471

Q: Please state your full name for the record.

THE WITNESS: My name is Gregory A. Wulchin.

Q: What is your date of birth?

A: April 18, 1965.

Q: Did you receive a subpoena to appear to testify today?

A: Yes.

Q: When did you receive it?

A: I don't remember the precise date, but it was during the week of August 9, 2004.

Q: Where are you employed at present?

A: I work for the CIA.

Q: When did you begin your employment in your current position?

A: September 27, 2004.

Q: What is your educational background?

A: I graduated from the University of Virginia in 1986 with a B.A. in biology.

Q: Have you attended conferences on indoor air quality?

A: Yes. I attended a conference in Baltimore on indoor air quality as an employee of HBI.

Q: Are you a member of any organizations relating to industrial hygiene?

A: I joined the American Industrial Hygiene Association when I was employed by HBI, but I've let my membership lapse since then as it does not relate to my current employment.

Q: Did you work in any employment related to indoor air quality before being hired by HBI?

A: No.

Q: After you left HBI were you employed in any positions related to indoor air quality?

A: I worked for Sigal Environmental in Washington, DC, from November 1993 to approximately February 1996, as a project manager on indoor air quality surveys, asbestos surveys, and energy consulting work.

Q: When were you employed by Healthy Buildings International ("HBI")?

A: I was employed by HBI for over five years, from April 1988 to November 1993. However, when I was first employed, the company's name was ACVA Atlantic, which was later changed to Healthy Buildings International. For convenience, I will refer to the company as "HBI" regardless of the time frame.

Q: What was your job title when you worked for HBI?

A: Field technician.

Q: Please describe your responsibilities as a field technician at HBI.

A: My primary responsibility at HBI was to inspect buildings, as a member of a two person team, for indoor air quality problems.

Q: Mr. Wulchin, what was the nature of HBI's business when you arrived as you understood it?

A: When I started, HBI was a company that specialized in the study and assessment of indoor air quality in commercial buildings in offices and other spaces within the building and in the building ventilation system.

HBI installed access points in the ducts of the ventilation system of these buildings to be able to inspect the ducts. HBI also sold a monitoring device called Samplaire that could be installed at the access point in the ducts. U.S. Exhibit 65101, at Exhibit A, pages 14-15 and 2, is

a quote to perform an indoor air quality inspection and install Samplaires in the Imperial Bank Building in San Diego, California. U.S. 65101, at Exhibit B, is an excerpt from an inspection report to the client on the inspection and installation of the Samplaires at the Imperial Bank Building. The Samplaires were small monitoring devices that were installed in the ducts at the access points. A quantity of air passed through a filter capsule in the device. The filter trapped dust and other matter that flowed through it on the filter. HBI returned every approximately six months to replace the filter capsules. To my knowledge, and I worked on several of these subsequent inspections, the filters were rarely inspected by a laboratory. While visual inspection of the ducts and testing in various rooms throughout a building are useful in evaluating indoor air quality, the filters were worthless.

Q: I want to talk to you about some matters that you addressed before the Subcommittee on Health and the Environment. Do you remember giving a signed statement to that Congressional subcommittee?

A: Yes.

Q: Mr. Wulchin, turning your attention to U.S. Exhibit 65101, do you recognize this exhibit?

A: Yes.

Q: What do you recognize this U.S. Exhibit 65101 to be?

A: U.S. Exhibit 65101 is my statement to the Subcommittee and the field notes and other documents supporting my statement.

Q: Turning your attention to your field notes in U.S. Exhibit 65101, at Exhibit A, pages 1 to 15, which relate to your inspection of the Imperial Bank Building in San Diego,

California, when did you inspect the Imperial Bank Building?

A: July 1989.

Q: What do your field notes reflect with regard to the indoor air quality of the Imperial Bank Building at the time that you inspected in July 1989?

A: As my field notes in U.S. Exhibit 65101, at Exhibit A, page 11, show, one area that I sampled, which is indicated at sample number 43, was a south room between suites 440 and 480 on the fourth floor of the building. One person was smoking in this room when I measured the particulate level in the room. I recorded a particulate measurement of 150 micrograms per cubic meter (ug/m3).

Q: What is the significance of a particulate level of 150 micrograms per cubic meter?

A: A particulate level of 150 micrograms per cubic meter is particularly high level of particulates. It is twice the level of 75 ug/m3, which HBI cited as the realistic upper limit for general offices areas. See U.S. Ex. 65101, at Ex. B, p.5.

Q: Upon completion of your inspection of the Imperial Bank Building, what did you do with these field notes?

A: I put my field notes in a file folder for final report writing by HBI's report writers, including Gray Robertson, the HBI President, and Peter Binnie.

Q: Are your field notes relating to the Imperial Bank Building in the same condition in U.S. Exhibit 65101, as they were when you submitted them to the file folder for report writing?

A: No. After I submitted the field notes the particulate measurement I recorded in sample 43 was changed. Additionally, there are handwritten notes that I recognize to be written by Mr.

Robertson.

Q: Mr. Wulchin, what was specifically altered in your field notes?

A: As shown in U.S. Exhibit 65101, at Exhibit A, page 11, the number "150" in the field notes was struck out, and the number "75" was inserted into my field notes. Handwritten notes, which were not written by me, appear in U.S. Exhibit 65101, at Exhibit 1, page 12, 'Mark up everything by "10."' Those notes were written in the column where the piezobalance measurements were recorded and where the measurements of samples 49, 50, and 51 were recorded. There are additional handwritten notes in the column where the carbon monoxide measurements were recorded, and those notes appear to say 'decrease "1" from everything.'

Q: Addressing the first alteration you list, what is the significance of altering the recorded data in your field notes?

A: Reducing the particulate reading shows particulate levels that are not as high as I recorded and suggests that smoking did not elevate the particulate levels as much as I actually recorded.

Q: Was the measurement of 150 micrograms per cubic meter an accurate measure of the particulate level of the room in sample 43 of the Imperial Bank Building?

A: Yes. 150 ug/m3 was an accurate measurement of the particulate level in the room.

Q: Did anyone contact you about changing the measurement from "150" to "75"?

A: No.

Q: Had you been asked about the accuracy of this measurement at the time, what would you have answered?

A: If anyone had asked, I would have answered that the measurement of "150" was accurate and representative, not abnormal or unrepresentative.

Q: Going back to the handwritten notes in U.S. Exhibit 65101, at Exhibit A, page 12, do you recognize the handwriting?

A: I recognize that to be Mr. Robertson's handwriting.

Q. Were the piezobalance measurements you recorded in U.S. Exhibit 65101, at Exhibit A, page 12 actually increased by 10 ug/m3 by HBI?

A. Yes. As shown in U.S. Exhibit 65101, at Exhibit A, page 12, every piezo measurement was changed by HBI in its final report on the Imperial Bank Building study and increased by 10 ug/m3.

Q: Was the Imperial Bank Building data the only instance in which you believe that HBI altered the results of your field measurements?

A: No. There were other instances in which HBI reduced field measurements of high levels of particulate in rooms where smoking occurred.

Q: Mr. Wulchin, do you recognize U.S. Exhibit 65097?

A: Yes.

Q: What is U.S. Exhibit 65097?

A: U.S. Exhibit 65097 is the report that HBI submitted in January 1990 to the Center for Indoor Air Research (CIAR), entitled "Measurements of Environmental Tobacco Smoke in General Office Areas."

Q: What does the report reflected in U.S. Exhibit 65097 address?

A: The report in U.S. Exhibit 65097 summarizes the results of field tests for environmental tobacco smoke conducted by HBI.

Q: Do you have any personal knowledge of the tests summarized in this report?

A: Yes. I conducted a number of the tests summarized in the report.

Q: Let's look at U.S. Exhibit 65101, at Exhibit I, page 1. Please explain to the Court what is found there.

A. That exhibit is from an inspection I performed. As indicated in the exhibit, I recorded that four cigarettes were smoked in the portion of the office that I inspected. Nevertheless, the particulate monitoring device, called a piezoelectric microbalance (piezobalance), registered ten entries of "0.0," meaning that it recorded no particulates in the air during the course of the hour-long inspection.

Q: Is that unusual?

A: It is highly unlikely that there was no particulates in the air. Even air that is not contaminated with environmental tobacco smoke normally contains a measurable quantity of particulates. The likely explanation for the result was that the piezobalance was malfunctioning. This happened on other occasions while I was working at HBI.

Q: If the piezobalance was malfunctioning, should you have submitted the results of that test in your report to HBI?

A: Yes. The ordinary practice at HBI was to let the HBI report writers, such as Gray Robertson, determine whether to use the results of the measurements that were collected in the field, or whether to send the field inspector back for additional measurements.

Q: Was the information that you recorded altered in U.S. Exhibit 65097?

A: Yes. U.S. Exhibit 65097, at Exhibit 6, page 18, entry 12 (page 16 of the table appended to the report)) shows the results of my August 8, 1989 inspection in the HBI report, but the average particulate measurement that I recorded is altered. The average "RSP" (respirable

suspended particulate) measurement in the report is 10 micrograms per cubic meter (ug/m3) – not 0.0 ug/m3 as recorded in my notes, U.S. Exhibit 65101, at Exhibit I, page 1.

Q: Do you believe that this alteration was justified?

A: No, it was not. The piezobalance was either working properly or was not working properly. If it was working properly, the correct particulate level would be 0.0 ug/m3. If the piezobalance was malfunctioning, as was probably the case, the measurement was not representative and should have been discarded. There is no reasonable justification for simply making up a new measurement as HBI did in this case.

Q: What is U.S. Exhibit 65106?

A: This is a letter dated December 19, 1994, from TSI Incorporated Particle Instruments Division to Representative Henry A. Waxman.

Q: Does TSI manufacture the Piezobalance that was used to take particle measurements in the field for the HBI study?

A: Yes.

Q: Do you agree with the statement in U.S. Exhibit 65106 that "[i]t is highly unlikely that a Piezobalance that is operating properly will measure zero at any time in a normal office environment"?

A: Yes.

Q: Do you agree with the statement in U.S. Exhibit 65106 that "[t]he probability of 10 zero measurements at a single location is very highly unlikely"?

A: Yes.

Q: Mr. Wulchin, turning your attention to the HBI report, U.S. Exhibit 65097, at

Exhibit 6, page 18, entries 19-20, and at Exhibit 6, page 10, entries 11-12, are there alterations in those designations based on your review of your field reports in U.S. Exhibit 65101, at Exhibit E, pages 4-9?

A: Yes. From review of the HBI report and my field notes in the areas that you indicate, it is clear to me that the particulate levels that I recorded in the field were altered by HBI during the preparation of HBI's report to CIAR, U.S. Exhibit 65097.

My field notes show, U.S. Exhibit 65101, at Exhibit 5, page 4, that I inspected a law office and a brokerage firm on August 10, 1989. I recorded an average of 4.0 and 2.0 ug/m3 of particulates respectively for those areas. However, in the corresponding report from HBI to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 18, entries 19-20, those measurements are reported as 40 and 20 ug/m3 respectively.

Similarly, my field notes, U.S. Exhibit 65101, at Exhibit E, page 7, show that I inspected a transportation office and an iron and steel office on January 13, 1989. I recorded an average of 0.0 and 7.0 ug/m3 of particulates respectively. However, in the corresponding HBI report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 18, entries 11-12, those measurements appear as 10 and 17 ug/m3 respectively.

Q. What is the impact of these changes?

A. Overall, changing values and misreporting data throws the entire study's validity into question. In the examples that I address above, many of the measurements that contributed to the lower averages were 0.0 ug/m3, which puts the results of the inspection in question, as the piezobalance was likely malfunctioning.

Q: Please describe the piezobalance measurement of indoor air particulates to the

Court .

A: A piezobalance measures the weight of particulates in the air in micrograms per cubic meter (ug/m3).

Q: Is there another device that can be used to measure indoor air particulate?

A: Yes, a particulate counter can be used.

Q: Please describe the particulate counter device.

A: A particulate counter counts the number of particles of a certain size range in a known volume of air.

Q: Did HBI inspectors use particulate counters as well as a piezobalance in ETS studies?

A: Generally no. HBI staff were instructed to use piezobalance in ETS studies. A particulate counter was sometimes used when the piezobalance malfunctioned or was unavailable for use.

Q: Can the data obtained from these methods be converted from one to the other?

A: I know of no way to reliably convert data between these two types of measurements.

Q: Based on your review of the your field notes in U.S. Exhibit 65101 and the HBI report to CIAR, U.S. Exhibit 65097, were particulate counts sometimes taken in lieu of piezo readings?

A: Yes. My review of HBI's ETS test forms indicates that on certain occasions, particulate counts were taken instead of piezo readings. Two examples are in U.S. Exhibit 65101, at Exhibit F, page 1 and page 4. What I find surprising about these examples is that in the HBI report, the company reported the particulate level in micrograms per cubic meter (ug/m3), as if a

piezobalance and not a particulate counter had been used. See U.S. Exhibit 65097, at Exhibit 6, page 15, entries 5-6 and entries 27-28. Based on my understanding from my training and experience, it is inappropriate to substitute piezobalance readings for particulate counts.

Q: Turning your attention to the HBI Report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 20, entries 39-40, based on your review of your field notes in U.S. Exhibit 65101, is there a mischaracterization of your inspection?

A: Yes. Reviewing these exhibits, I see that on September 20, 1989, I inspected a hospital cafeteria in Jacksonville, Florida. A copy of the ETS test form that I submitted to HBI is contained in U.S. Exhibit 65101, at Exhibit G, page 1. I tested for particulate levels in both the smoking section and the nonsmoking section of the cafeteria at the same time. During the test period, 18 cigarettes were smoked in the cafeteria. Not surprisingly, I recorded high levels of particulates in both sections of the room (an average of 168 ug/m3 in the smoking section and 116 ug/m3 in the nonsmoking section). These results indicated that in this case, the simple physical separation of smokers and nonsmokers in the same room was not an effective strategy for control of environmental tobacco smoke.

In the HBI report to CIAR, however, the two tests I conducted in the same room are listed and tabulated as if they were inspections conducted in separate rooms. See U.S. Exhibit 65097, at Exhibit 6, page 20, entries 39-40. The HBI report to CIAR treats the data like its from two separate rooms, rather than one large room with no division between the smoking and nonsmoking sections. In my training and experience, this is a mischaracterization. The cafeteria was not a nonsmoking room. To the contrary, many cigarettes were smoked in the room during the test of the nonsmoking section. It is a mischaracterization to treat the nonsmoking section of

a room with heavy smoking as a room in which no smoking is occurring.

Q: What is the significance of this mischaracterization?

A: The result of HBI's mischaracterization was to skew the results of its analysis. Treating a section of a smoking room as a nonsmoking room raises the average particulate level of the nonsmoking room, obscuring the differences between smoking and nonsmoking areas.

Q: Based on your review of your field notes in U.S. Exhibit 65101 and the HBI report to CIAR in 65097, are there instances where HBI recorded a smaller local area and not the size of the entire room?

A: Yes. Reviewing my field notes in U.S. Exhibit 65101, at Exhibit H, page 1, I see that on August 14, 1989, I inspected an office in Richmond, Virginia. This office had an area of 1000 square feet. The local area of the test, which is the area in which I would count the number of cigarettes smoked, was 300 square feet. There were no partitions dividing the local test area from the larger office. Air could circulate freely from the local test area to the larger office. However, in the report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 18, entry 26, the room size is reported as 300 square feet, the size of the local test area, yet the room, as shown in my field notes, was actually 1000 square feet. My review and comparison of these exhibits also shows that there were numerous other instances where room sizes were erroneously underreported in summarizing the inspections I conducted. Compare U.S. Exhibit 65101, at Exhibit I, page 1 (room size recorded as 1500 square feet), with U.S. Exhibit 65097, at Exhibit 6, page 18, entry 12 (room size reported as 375 square feet); U.S. Exhibit 65101, at Exhibit I, page 4 (room size recorded as 1500 square feet), with U.S. Exhibit 65097, at Exhibit 6, at page 10, entry 26 (room size reported as 600 square feet); U.S. Exhibit 65101, at Exhibit I, page 7 (room

size recorded as 1800 square feet), with U.S. Exhibit 65097, at Exhibit 6, page 10, entry 30 (room size reported as 252 square feet); U.S. Exhibit 65101, at Exhibit I, page 10 (room size recorded as 1920 square feet), with U.S. Exhibit 65097, at Exhibit 6, page 11, entry 4 (room size reported as 288 square feet).

Q: What is the significance of HBI's use of the smaller room sizes in the HBI report to CIAR, U.S. Exhibit 65097?

A: Reporting the smaller local area in a partitioned larger room and not the size of the entire room raises the smoker density level, while RSP and nicotine levels may be reduced by the larger volume of air that freely circulates in the larger room. Smoker density is discussed in the HBI report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 6 in the second paragraph. It is a key input in HBI's statistical model, and HBI defines "smoker density" as the number of cigarettes smoked per hour per unit of office area.

Q: What are U.S. Exhibits 65103 and 65104?

A: These exhibits are field inspection data that were provided by HBI to the House Subcommittee during its investigation.

Q: Are these field inspection data addressed in the HBI report to CIAR, U.S. Exhibit 65097?

A: Yes.

Q: Were field inspection data like that found in U.S. Exhibits 65103 and 65104, prepared at or near the time that inspections were made by HBI by a person with knowledge of the data as part of a regularly conducted business activity and routinely maintained by HBI as a business record?

A: Yes.

Q: Based on your review of U.S. Exhibits 65103 and 65097, are there any peculiarities in that would cause you concern regarding the accuracy of the HBI report to CIAR in U.S. Exhibit 65097?

A: Yes. The inspector clearly writes, "Did not have Piezobalance on site." So no measurement of respirable suspended particles (RSP) could be recorded for the smoking and nonsmoking sections of the bank's cafeteria. However, later in HBI's report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 26, entries 33-34, the corresponding data show levels of 30 and 20 ug/m3 RSP for the smoking and nonsmoking sections of the cafeteria. There appears to be no basis for these numbers.

Q: After reviewing U.S. Exhibit 65104 and U.S. Exhibit 65097, do you have any concerns about the data reported in U.S. Exhibit 65097?

A: Yes. Similar to the exhibit addressed above, on the data sheet contained in U.S. Exhibit 65104, the notation appears as "PIEZO ON THE FRITZ!!" However in the HBI report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 15, entries 17-18, the counterpart data show levels of 30 and 10 ug/m3 RSP respectively for the lunch room and computer room of the bank. Again, there appears to be no basis for these numbers.

Q: Mr. Wulchin, turning your attention to U.S. Exhibit 65107, do you recognize that document?

A: Yes.

Q: Please describe U.S. Exhibit 65107 to the Court.

A: U.S. Exhibit 65107 is a collection of field notes drafted by various HBI technicians,

including myself.

Q: Were field inspection data like that found in U.S. Exhibit 65107 prepared at or near the time that inspections were made by HBI by a person with knowledge of the data as part of a regularly conducted business activity and routinely maintained by HBI as a business record?

A: Yes.

Q: After reviewing U.S. Exhibit 65107 and U.S. Exhibit 65097, do you have any concerns regarding the data reported in the HBI report to CIAR?

A: Yes.

Q: What are those concerns?

A: As with the exhibits that I addressed above, the data in U.S. Exhibit 65107 contains numerous discrepancies between the data sheets and summary report by HBI to CIAR, U.S. Exhibit 65097. First, piezobalance readings as they were recorded in the data sheets were altered in the HBI report to CIAR. For example, on page 5 of U.S. Exhibit 65107, the piezobalance RSP data show individual data points and averages for two sets of measurements all equal zero for 500 square feet and 2000 square feet computer areas in a bank with one and three cigarettes smoked respectively. However, in the HBI report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 19, entries 25 and 26, the corresponding data for a large office area and computer office area both are reported as having 20 ug/m3 RSP levels. Similarly, U.S. Exhibit 65107, at page 4, shows that in September 1989, the piezobalance RSP data show individual data points and averages for two sets of measurements all equal zero for two 500 square feet areas with one cigarette smoked in each. In the HBI report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 19,

entries 23 and 24, the corresponding data reported those office areas as both having 10 ug/m3 RSP levels. Additionally, on page 3 of U.S. Exhibit 65107, the piezobalance RSP data show individual data points and averages for two sets of measurements all equal to zero for a 400 square feet and a 1000 square feet computer area with zero and one cigarettes smoked respectively. This contrasts from the HBI report to CIAR, U.S. Exhibit 65097, at Exhibit 6, page 19, entries 21 and 22, where the corresponding data reported the large office area and computer office areas as having 10 and 12 ug/m3 RSP levels respectively.

Second, as I stated earlier, the occurrence of zeroes in piezobalance RSP readings can occur for two reasons 1) the piezobalance is malfunctioning, or 2) the air is very clean. It is highly unlikely in a typical office in the absence of smoking and virtually impossible in the presence of smoking to record multiple zero particulate measurements in a row on a properly functioning piezobalance. On numerous instances, on HBI's data sheets in U.S. Exhibit 65107, multiple piezobalance readings in a row were recorded as "0" on the data sheets, see pages 2 through 6 of U.S. Exhibit 65107.

Q: During your tenure at HBI, what was that organization's position with respect to environmental tobacco smoke?

A: HBI took the position that environmental tobacco smoke problems can be eliminated with good ventilation practices.

Q: Do you agree with HBI's position that good ventilation practices can eliminate indoor air quality problems that result from environmental tobacco smoke?

A: No. HBI's position is not supported by many of the inspections that I conducted for HBI. In many instances, I recorded high levels of particulates from cigarettes in rooms with good

ventilation and low levels of carbon dioxide. The level of carbon dioxide is a common measure of the adequacy of ventilation. The results of an inspection that I conducted in Richmond, Virginia, on August 14, 1989, is a good example of this situation. A copy of the ETS test that I conducted is contained in U.S. Exhibit 65101, at Exhibit K, page 1. As shown in that instance, the smoking of two cigarettes in a 440 square foot office raised the particulate level to an average of 140 ug/m3, which is well above HBI's standard of 75 ug/m3. This elevated level occurred despite the presence of good ventilation and a low carbon dioxide concentration of 570 parts per million.

Q: Mr. Wulchin, based on your training and experience as an employee of HBI and your review of HBI documents, what is your view of the data that HBI collected from buildings?

A: My experience with HBI data, as well as my review of HBI reports, leads me to conclude that HBI's data contain unexplained entries that raise serious questions about the integrity of its studies.

Q: Thank you Mr. Wulchin.